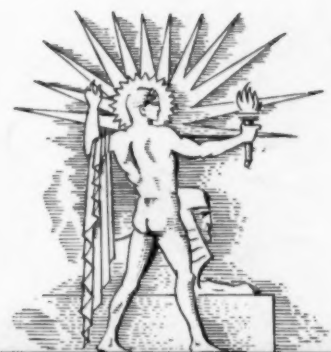
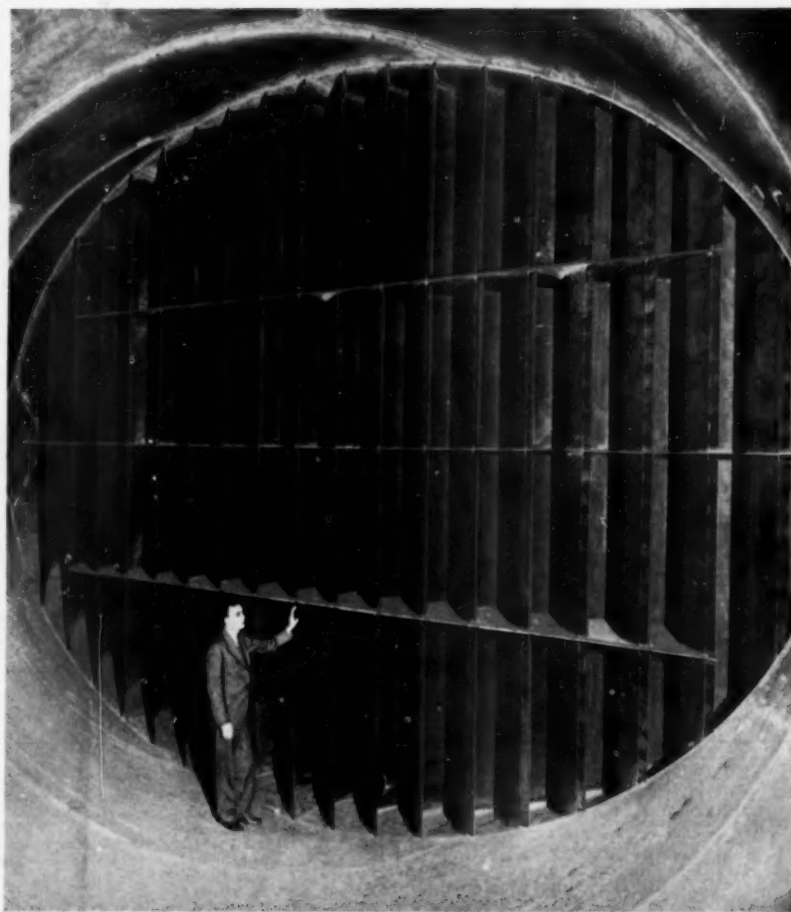


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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



April 1, 1939

Wind Vanes

See Page 195

A SCIENCE SERVICE PUBLICATION

Do You Know?

A new treatment for black eyes consists of applying a chemical called histamine by aid of electric current.

In banding birds to trace their wanderings, British observers use seven sizes of bands to fit British birds, from wren to eagle.

A geologist says the lowest part of North America that is not dry land is in Lake Huron, where the depths reach 500 feet below sea level.

"Fiji Islander" no longer suggests wildness; 90,000 natives in this British crown colony live government-controlled lives under their own chiefs.

On exhibit at the British Industries Fair this year is an anti-aircraft searchlight which throws a 10,000-watt beam and is designed for London defense.

About 50 letters a day ask the Interior Department about prospects for settling in Alaska's Matanuska Colony, but the colony is not being expanded.

The Spanish War has seen a trend toward simplification in treatment of war wounds, partly as a matter of economy, with fewer medicaments used and more reliance on nature's healing power.

The Metropolitan Museum in New York has obtained an Italian bronze burial urn of eighth century B. C., shaped like the huts in which primitive Italians lived before the domination of Etruscans and Romans.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

AERONAUTICS

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AGRICULTURE

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ICHTHYOLOGY

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Why will the crew of the new research ship Research be forbidden to carry steel pocket knives? p. 202.

POPULATION

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PSYCHOLOGY

What accounts for that feeling of familiarity we sometimes have in connection with new experiences? p. 200.

What has your mental "set" to do with your vision of colors? p. 203.

PUBLIC HEALTH

In what way has the situation in Europe affected health problems? p. 197.

SEISMOLOGY

What states have never had an earthquake? p. 195.

TECHNOLOGY

How does ultraviolet light cut down the time needed for "hanging" meat? p. 197.

The pompadour fish gets its name from its dorsal fin which suggests hair brushed back from a forehead.

A coyote and a bighorn sheep trapped on an island in the Boulder Dam region were recently reported to be living together peaceably.

A pharmaceutical company has a collection of ancient feeding bottles, spoons, and baby cups, including some from Indian babies' graves.

A noted British astronomer says that Mars seems to be in the state that the earth will reach some day, when its oxygen is almost entirely exhausted by the progressive weathering and oxidation of the rocks.

The Field Museum in Chicago has a wooden crochet needle used by some woman—or man—in the New Stone Age five or six thousand years ago, and found in a prehistoric lake dwelling in Switzerland.

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ICHTHYOLOGY

Find "Extinct" Fish Alive In South African Waters

Big Blue Creature With Goggle Eyes Causes as Much Surprise as Would the Discovery of a Living Dinosaur

HINT of a "Lost World" beneath the sea, a survivor of long-gone geologic ages, has been hauled up in a trawler's net off the east coast of South Africa: a fish of a kind supposed to have disappeared utterly from the earth 50 million years ago.

Word received in Washington, D. C., was heard with amazement by scientists of the Smithsonian Institution, as if some one had announced the discovery of a living dinosaur. But the strange find is attested by the word of colleagues "down under" known to be competent and hard to fool. It seems impossible; yet apparently it's real.

The fish is a rather big one, about five feet long, dark blue in color with a metallic luster, with big goggle eyes. It has two back fins, the forward one in two sections or lobes. The paired fins under its body are almost leg-like, paddle-shaped in outline. The two lobes of its tail-fin are uneven.

Closer inspection shows a pair of openings, known as spiracles, behind the eyes, sharp conical teeth like a cat's, heavy bony plates under the wide jaw. The skeleton is made not of bone but of cartilage.

Very Primitive

All this, to scientists, is a picture of an exceedingly primitive type of fish. Some of the skeletal characters, and especially the bony jaw plates, mark the specimen as a surviving member of one of the most ancient groups of fishes, known as the Crossopterygians. There is no common name, for the whole family is supposed to have become extinct at least 50 million years ago, in Mesozoic time, the age of dinosaurs.

This family originated in the Devonian age, more than 300 million years ago, and most of them were gone even before the Mesozoic. Nearest relatives among fish still abundant are the sturgeons and the bowfin or dogfish of the Great Lakes and other freshwater bodies.

The capture of the strange sea monster has naturally caused a good deal

of commotion in South Africa. First man to see it was Capt. H. P. Goosen, commander of the trawler. When he found this strange-looking five-foot fish staring at him with goggle eyes when the net came up from a 250-foot depth, he knew it was something out of the ordinary.

So he took it to East London, nearest South African port where there was a museum. The curator, Miss Courtney Latimer, immediately identified it as a rare and primitive species. The museum's taxidermist, preparing it for mounting, discovered the primitive cartilaginous character of its skeleton.

Dr. J. L. B. Smith, zoologist at Rhodes University College, Grahamstown, hurried back from his vacation to see the

new find, and found another evidence of its primitiveness in a substance on its scales, known as ganoin. Further studies were made by two scientists of the South African Museum in Capetown, Drs. E. L. Gill and K. H. Barnard. They confirmed the unique nature of the fish, and its membership in the supposedly extinct Crossopterygian family.

Consensus of South African scientific opinion is expressed by Dr. Smith: "This is unquestionably one of the most valuable zoological specimens in the world today. Its scientific value is absolutely incalculable."

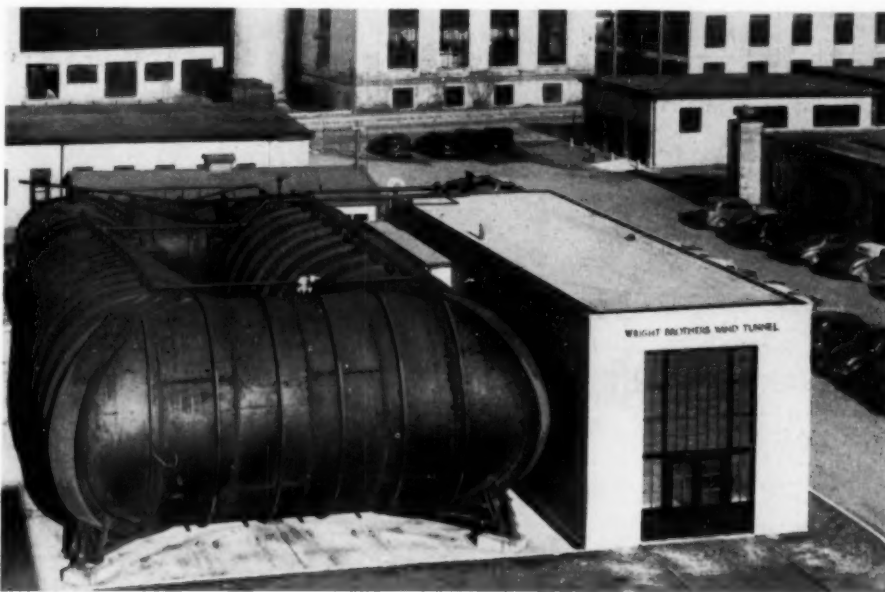
Science News Letter, April 1, 1939

SEISMOLOGY

Earthquake History of U. S. Compiled by Coast Survey

WHERE would you go to live if you wanted to be safe from earthquakes? Scientists decline to answer. They recall that two of the most severe disturbances in the history of this country, the New Madrid earthquake of 1811 and the Charleston earthquake of 1886, occurred in regions not counted as particularly seismic.

Scientists can, however, tell you in



TWICE AS FAST AS A HURRICANE

The wind blows fast inside the new Wright Wind Tunnel of the Massachusetts Institute of Technology, where scientists are able to obtain data on 400-mile-an-hour airplanes under atmospheric conditions like those found at 35,000 feet above the earth. It looks like a lot of structure to test scale models; just note the size of autos parked in the street next to it. It is one of the world's few variable density (i. e., variable atmospheric pressure) tunnels, which were pioneered by Uncle Sam's National Advisory Committee for Aeronautics. On the cover of this week's SCIENCE NEWS LETTER is shown the guide vanes for the huge wind box which take turbulence out of the air stream, guide it around the corners of its rectangular route. The air stream is turbulent because of the blowers and must be smoothed out to give results that have any meaning. The whole wind tunnel is tightly sealed so that the pressure may be varied.

what regions the fewest earthquakes have occurred in the past, and if you can extrapolate from history and call it prophecy, you are entitled to such comfort as that will give you.

The U. S. Coast and Geodetic Survey has just issued an earthquake history of the United States. The division into two sections, one for California and western Nevada, the other for all the rest of the country including Alaska, is by itself eloquent of the uneasiness of the earth in the region between the Sierra and the sea. Yet numbers of shocks are not necessarily significant; the great majority of California's earthquakes are mere dish-rattlers. Only, scientists are interested in little specimens as well as big ones, so they record them all, regardless of intensity.

Only three states in the Union have histories of no recorded earthquakes at all: West Virginia, Wisconsin and North Dakota. Four have only one each, but with a difference. The single shocks recorded for Rhode Island and the District of Columbia were insignificant, whereas Mississippi and Louisiana have each had a quake classified as of intensity 7 on the seismologist's scale—severe enough to upset furniture and knock down plaster.

Delaware and Iowa have felt only two slight earthquakes apiece; Minnesota two, classed as "moderate." Quakeless North Dakota's sister state, South Dakota, has felt the shock of six earth movements. Texas, with its enormous area, might be expected to have a high place in the column. Actually, however, only seven earthquakes are listed for the Lone Star State.

Science News Letter, April 1, 1939

AERONAUTICS

WPA Built 154 Airports, Improved 494 Others

THE WORKS Progress Administration in three and a half years ending Dec. 31 last has built 154 new airports, improved 494 others and placed hundreds of air navigation aids, WPA Administrator Col. F. C. Harrington announced.

The WPA has spent more than \$112,000,000 on such projects and has contributed the bulk of public aviation ground facilities erected since the WPA was established in 1935. Nearly 38,000 men are now at work on further projects.

Science News Letter, April 1, 1939

A North Carolina company is making office furniture out of pecan wood.

PHYSICS

Confirm Release of Neutrons From Splitting Uranium Atoms

FRENCH scientists have confirmed the American discovery that splitting uranium atoms, releasing their enormous amount of atomic energy, also give off neutrons in the reaction.

This liberation of neutrons from uranium atoms split by impact with other neutrons, is most important because it provides a mechanism which, at least theoretically, might serve to keep the chain of splitting continuing and hence produce a continuous release of atomic energy.

Scientists F. Joliot, H. von Halban, Jr., and L. Kowarski of Paris report the discovery. (*Nature*).

Prof. Joliot and his co-workers find that neutrons (neutral atomic particles) from a source of radium and beryllium can split uranium atoms placed nearby. Along with the energy released additional neutrons are given off in the process. This discovery is comparable with, and a confirmation of, the announcement (See SNL, March 11, March 18) that scientists at the Carnegie Institution of Washington's Department of Terrestrial Magnetism had been able to observe the same reaction in atomic transmutation.

These American scientists, Drs. Richard B. Roberts, R. C. Meyer and P. Wang, found that the secondary neutron emission from the uranium splitting was delayed by some seconds. There is no indication whether the new French experiments also describe a delayed effect or whether the emission of the neutron happened immediately.

Also the American workers would like to know if the experiment really was done with the neutrons obtained from radium-beryllium sources which have energies of 480,000 electron volts, or whether these 480,000 electron volt neutrons were slowed down with large paraffin blocks, then allowed to strike the uranium and split it.

Uranium splitting with these "slow" neutrons is nothing startling now, for it has been done in many laboratories in the few short weeks since the initial discovery. Splitting with 480,000 electron volt neutrons is something else, however. At Carnegie Institution such neutrons were tried but no evidence has yet been found of uranium splitting for these energies.

Science News Letter, April 1, 1939

AERONAUTICS

Fire Aloft May Be Conquered By Safe Fuel and New Engines

FIRE aloft, aviation's most fearsome hazard, appeared nearer substantial elimination by a special safe airplane fuel and engines similar to present types to use it.

The fuel may even make possible larger and more powerful engine cylinders than those of today.

A separate approach from the yet unproved Diesel engine, a petroleum fuel, with an octane rating comparable to the best grades of gasoline but with a high enough "flash point" to prevent explosions, has been found and can be burned efficiently in spark-ignition motors of modified design, Frank C. Mock of the Bendix Aviation Corporation told the Society of Automotive Engineers.

The fuel itself, which has an octane rating of 87, the same as the gasoline

used for cruising airliners, was first found more than a decade ago, Mr. Mock related, in the hunt for a safe high-powered petrol for the motors that drive airships. It cannot be used in an ordinary engine because it does not vaporize as easily as gasoline.

Interest in lighter-than-air craft at an ebb in the United States, interest in the special fuel likewise died, he said. But in the last few years, as fire remained the single most destructive untamed force in aviation, scientists have returned to the attack. The refining companies have since added several other fuels of similar type. Mr. Mock cautiously estimated that five more years of intensive development work are still necessary.

The familiar carburetor will have to

be replaced by special fuel injectors to handle the petroleum product, Mr. Mock declared.

Chief modifications of a standard engine are to direct the high "flash point" fuel, which has a density 15 per cent. greater than gasoline, toward hot parts of the cylinder so that it may be readily vaporized. Starting an engine powered by it is at present a difficulty, because of the need for vaporizing the fuel, but the type of ignition employed to start house furnaces may prove satisfactory, the Bendix engineer continued. Suitable injection pumps, control devices and

other accessories are already available to the engine manufacturers who may desire to go ahead with the development.

Use of the new fuel may at the same time help solve two cooling difficulties faced by engine designers, and lead to larger engine cylinders. Heat needed for vaporization can be absorbed from otherwise overheated exhaust valves and pistons. Cylinders and pistons large enough to make 18 cylinders do where 24 would now be required may thus be made possible, Mr. Mock pointed out.

Science News Letter, April 1, 1939

PUBLIC HEALTH

Refugees and Air Raid Plans Bring Europe Health Problems

League Health Section Anticipates Coming Worries; International School for Advanced Study Planned

REFUGEES; plans of all European governments to move city dwellers to the country as protection against air raids; and nutrition are the most important European health problems now facing the Health Section of the League of Nations, Dr. Ludwig Rajchman, recently retired director, told members of the Pan American Medical Association.

The refugee health problem involves hundreds of thousands in Europe and millions in Asia, Dr. Rajchman said.

The Health Section of the League of Nations, he explained, can help European governments plan extension of sanitary and public health services in rural areas so as to prevent epidemics or other threats to health that might arise when large numbers of urban civilians are moved to the country. Such moves are already planned by all the governments as precautions against loss of life in the civilian population during air raids.

One function of the organization, he said, is to give governments advice of this sort on special health problems or in connection with formulation of health policies. Another purpose of the organization is to think out in advance problems which may come before the national health services and to be ready to advise on such problems.

As part of its activities, the League has decided to organize a conference on rural health for all the Americas, to be held in Mexico City before the end of the year.

In view of the importance of the League's work in bringing together public health leaders for round table discussions of present and future problems, the French government has offered to set up in Paris an International School of Advanced Study in Pub-

lic Health. Necessary appropriations, Dr. Rajchman said, have been voted by the French chamber of deputies and now await approval of the French Senate which is expected shortly. Unless grave complications arise in Europe, the school will probably be set up this year.

Science News Letter, April 1, 1939

TECHNOLOGY

Sterilizing Lamp Tenderizes Tough Hamburger Beef

MAKING a "poor man's filet mignon" out of tough hamburger beef is the newest feat of modern industrial science.

Germ-killing ultraviolet rays plus an application of air conditioning now make it possible to tenderize in a few days tough cuts of beef which formerly could be ripened only by weeks of "hanging." This method, worked out over a period of four years by scientists of the Mellon Institute for Industrial Research, enables the raising of all types of beef by one grade in the scale of ratings of palatability.

Trick of the method, devised by Dr. Marion D. Coulter, industrial fellow, is to use high temperature and humidity to bring about quickly the chemical enzyme reactions that turn the tough connective tissue in meat into a gelatinous material which is easy to bite through. It is the breakdown of the connective



TENDERIZING RAYS

The germ-killing ultraviolet lamp above with air conditioning, cuts the time of the old fashioned "hanging" for making meat tender. Inspecting the device are its developers, Drs. Marion D. Coulter and H. C. Hentschler.

tissue in the slow hanging and ripening process which makes meat tender.

However, the high humidity and temperature also promote bacterial growth which normally would make the meat spoil before it became ripe. To cut down this action by microorganisms that cause decay, special ultraviolet lamps are used whose powerful, invisible rays kill these organisms. By the combination, therefore, quick ripening is obtained without spoiling.

The new development is most important to the meat packing industry, which now has large investments in buildings used for storing and slow ripening the better grades of meat. The process is so quick that there is no waste in the cut of beef as there is in hanging, where it is necessary to remove completely the final discolored outer layers and use only the ripened "heart." The use of high humidity saves loss of weight in the meat due to its loss of water during the customary ripening stage.

The new advance was made possible by joint research on the part of scientists of the Kroger Food Foundation, the Westinghouse Research Laboratories and Mellon Institute. Better meat for lower prices is the promise to the consumer.

Science News Letter, April 1, 1939

AERONAUTICS

New Air Corps Bombers Rated At Near 400 M.P.H.

THREE new attack bombers now being started through exhaustive U. S. Army Air Corps tests are reported unofficially to have top speeds close to 400 miles an hour, higher than is claimed for any other bombardment aircraft in the world.

Small ships with big engines all, they are the deadliest aerial weapons ever placed in the Air Corps' hands. Their mission is attacking ground troops, as well as general bombardment duties near front lines. Two of the designs have high wings so that the machine gunners can see better the troops they are strafing.

They are the first American bombers with smooth-as-satin outside finish. All rivets are countersunk, to add to the planes' speed by cutting drag. All three, submitted by the Stearman Aircraft Company, the Glenn L. Martin Company and North American Aviation, Inc., for competitive testing by the Air Corps, have been designed with high speed, quantity production in mind.

Science News Letter, April 1, 1939

PHYSICS

Mechanical Model Shows How Electric Waves "Look"

A MECHANICAL model which helps you to visualize unseeable electrical waves has been invented by C. F. Wagner of the Westinghouse Electric and Manufacturing Company. With the device a surge of electrical current lasting only one ten-thousandth of a second can be prolonged to five or ten seconds, time enough for engineers to study the wave pattern.

One major usefulness of the machine is to study what happens in a transmission line when a lightning bolt strikes it. It is possible to show how a lightning arrester on such a line acts as "a dam" to hold back the abnormal voltage and permit only a safe amount to continue through the wires.

The working model is made possible because there is found to be a close, analogy between inductance, capacitance and resistance in an electrical system and mass, spring resilience and damping elements in a mechanical model.

Applying this knowledge, Mr. Wagner has produced what looks like a

long xylophone, consisting of 56 long narrow aluminum arms mounted at their center of gravity on hardened steel bearings. A flat spring is mounted rigidly to each arm and the free end of the arm is attached to the adjacent arm. When the first arm is oscillated, it transmits its motion to the next arm, and so on, and produces effectively a wave type of transmission.

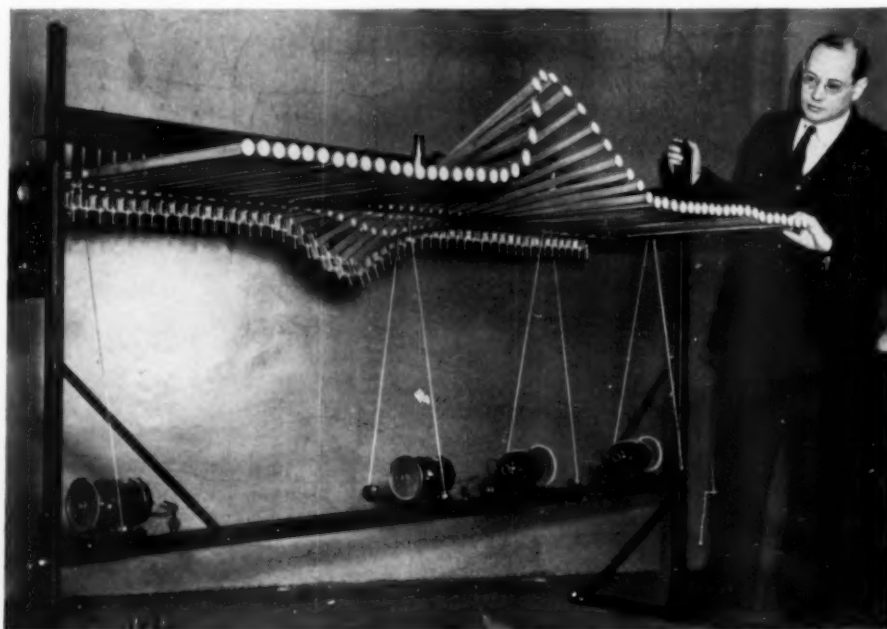
Science News Letter, April 1, 1939

ENGINEERING

Undertake Standardization Of Airplane and Motor Parts

PRINCIPAL aeronautical organizations have taken steps at a meeting to standardize airplane parts commonly used throughout the world, the American Standards Association announced. The work will be carried out by the International Standards Association. Plane and engine parts and fuel specifications will be chiefly affected.

Science News Letter, April 1, 1939



THEY LOOK LIKE THIS

This mechanical model helps visualize transmission of electrical waves. C. F. Wagner of the Westinghouse Company demonstrates his device that looks like a xylophone but which gives a picture pattern of wave transmission. Engineers are able to demonstrate little-understood electrical properties of transmission lines with the device, including the action of lightning strikes on the line.

POPULATION

Hitler Must Deal With New Racial Problems

Fully a Half of the Jews in the Region Affected By Latest Crisis Are Poor and Set Apart in Customs

ENTIRELY new racial problems will face Hitler in his dealing with the people of Czechoslovakia.

There were 380,000 Jews in Czechoslovakia before its dismemberment, according to an estimate made in 1937. But an analysis of the population made by Dr. Christopher Tietze, population expert at the Johns Hopkins University, for Science Service, indicates that fully one-half of these are Jews of a type with which Hitler has never had to deal before.

The Jews of Bohemia and Moravia belong nearly all to the white collar class as did the German Jews. They speak German or Czech for the most part. They live, dress, eat and work in much the same way as their neighbors. They are "assimilated."

The Jews in Carpatho-Russia, the Eastern part of the region affected by the new crisis, present a very different picture. They think of themselves as Jewish in nationality as well as religion. They speak Yiddish and follow their own ancient customs in dress and ways of life.

The region in which they live is to be a part of Hungary, not Germany, at least at present. But the fact that they are not directly under the dictatorship of Hitler now can offer them very little reassurance.

These eastern Jews are poor—extremely poor. They can contribute no wealth to the German Reich. They are very much like the Jews that came to the United States from Russia in great numbers several years ago. Very few can be called middle-class. Almost none belong to the professional class.

Although the Bohemian and Moravian Jews include a disproportionately large number of old people and few children, these eastern Jews have large numbers of babies and small children. The birth rate among these people gives an average of four babies to each woman who has lived through the child-bearing age as compared with an average of only one child per woman among the Jews in Bohemia.

Between the eastern Jews of the Carpatho-Russia and the western type of Bohemia and Moravia are the Jews of Slovakia who are also of a middle type in culture, language and assimilation. These Jews, who are quite unlike the Jews of Germany, will now be dealt with by Hitler.

The gypsies of Slovakia will present another racial problem, for there are more than 30,000 living there. They are also people of different ways and they have many children. Many of them are nomadic.

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Germany Equals Rome

GERMANY, shouting for more territory, now has an area almost exactly equal to that of the old Holy Roman Empire in 1806, just before its fall.

With the annexation of Bohemia and Moravia, Germany has an estimated 244,000 square miles; the Holy Roman Empire in 1806 included 243,000 square miles, it is revealed by a study of the growth of Germany just completed by Dr. Tietze.

The annexation of Slovakia brings Germany's territory up to 259,000 square miles.

The population of Germany is, however, very much greater than that of the Holy Roman Empire. It includes 10,000,000 non-German subjects.

Including Slovakia, Germany has a grand total of 88,500,000. The last Holy Roman emperor ruled 29,000,000 people; at the peak of its expansion, the empire held sway over 370,000 square miles of territory, but the population numbered only 16,000,000.

Germany today has 25 per cent. more territory than she had before the World War in 1914, Dr. Tietze's study reveals. Starting with a nucleus of 140,000 square miles in the East Franconian Empire after the treaty of Verdun in 843, and 270,000 square miles under Conrad I, the first German king, Germany had only 260,000 square miles in the German Federation under Austrian

RADIO

Lewis W. Waters, vice president in charge of research, General Foods Corporation, will be the guest scientist on "Adventures in Science" with Watson Davis, Director, Science Service, over the coast to coast network of the Columbia Broadcasting System, Saturday, April 8, 6:15 p. m. EST, 5:15 p. m. CST, 4:15 p. m. MST, 3:15 p. m. PST. Listen in on your local station. Listen in each Saturday.

leadership in 1815 and only 209,000 square miles in the German Empire after its proclamation in Versailles in 1871.

The area of the German Empire remained the same until after the Great War when it was cut to 181,000 square miles.

In the last five years this territory has increased 43 per cent. The Saar territory built it up to 182,000 square miles; Austria made it 214,000, the Sudetenland 225,000, Bohemia-Moravia 244,000 and Slovakia 259,000 square miles.

The population growth was not proportional. The increase in population since 1930 is, however, 38 per cent.—from 64,300,000 to 88,500,000. Germany's expansion has not meant much more room for her population.

The population data used by Dr. Tietze in this study are estimated for those years before 1871. Other estimates may differ by several millions from these, but accurate census figures are not available.

Science News Letter, April 1, 1939

AERONAUTICS

Wing of Stratoliner Same As Flying Fortress

APPARENT failure of the wing of the giant Boeing 307, which crashed and killed ten persons near Seattle, is puzzling to informed aeronautical men, because the wing of the 22-ton passenger plane is believed to be identical with the wing of the Army Air Corps' world-famous "Flying Fortress" bombers, which have been proved by years of strenuous service.

The accident is one of the extremely few in recent years in which structural failure appeared to be involved, thus adding to the general air of mystery surrounding the crash. The last disaster in this category involved a commercial airliner, of a type not widely used in the United States, whose tail assembly came off, due to a faulty design subsequently corrected on all planes of that class.

Science News Letter, April 1, 1939

ARCHAEOLOGY—MATHEMATICS

European Mathematician Studies "Old Files"

GOING over old files—thousands of Babylonian business letters, contracts, school books, all written on clay—is the task that has drawn a celebrated mathematical historian to America. He is seeking light on the beginnings of arithmetic in Babylonia, and even before the Babylonians.

Although he has been in the United States only a few weeks, Prof. Otto Neugebauer, formerly of the University of Copenhagen, has already checked 25,000 Babylonian tablets at Yale off his list of things to do.

Author of a three-volume work on all known ancient mathematical texts, Prof. Neugebauer will make his headquarters at Brown University, as professor of mathematics. He plans to examine Babylonian writings at the University Museum in Philadelphia and other outstanding collections of these ancient records.

Science News Letter, April 1, 1939

PSYCHOLOGY

Hypnosis Used To Study Memory Perversions

DID you ever walk into a strange house and have the feeling that you had been there before? Or perhaps you have puzzled your mind over why a person you had never met before seemed familiar.

Most people do have experiences of this sort. Psychologists have a name for it—the phenomenon of *déjà vu* (already seen). It is also termed paramnesia, meaning a perversion of memory in which a person believes that he remembers events or circumstances that never happened.

The only explanation for the phenomenon, which is more apt to occur when you are tired or ill, is that some features of the new acquaintance were similar to those of a person you already know, or that some element in the new situation is one you have actually experienced before.

With an idea of finding out more about this phenomenon, H. Banister and O. L. Zangwill, psychologists of Cambridge University, turned to hypnotism.

On the first day of their experiments, undergraduate students of psychology, ignorant of the purpose of the study, were shown colored postcards and given odorous substances to smell. On the following day each of the undergraduates was hypnotized, shown more postal

cards, and given more things to smell, and at the same time was told that he would forget all about these things and be totally unable to recognize them when he awoke. On the third day the student, wide awake again, looked at and smelled all the things of the first two days plus a few more of the same sort. The ones from the second day's test all seemed familiar, but the student did not remember having seen or smelled them the day before while hypnotized.

Reporting the tests to the scientific journal, *Nature*, the Cambridge psychologists conclude that the impression of familiarity typically arises under certain conditions, such as illness or fatigue, in which the brain cannot subject impressions to introspective scrutiny.

Science News Letter, April 1, 1939

PHYSICS

Atomic "Gun" Developed To Bombard Live Materials

A NEW device used to bombard biological specimens with negative charges of electricity, the electrons, has been developed by a four-man research team of scientists at Massachusetts Institute of Technology and Union College.

The new design permits multiple samples of organisms to be placed in the machine on a drum which, by rotation, brings any particular specimen into the beam of the electrons.

In the apparatus electrons are made to "shoot around a corner" and hit their objective. As they issue from a filament they speed off and are bent by an electrostatic field in a curvature that amounts to 90 degrees. This action spreads out the beam and keeps all electrons of any single energy moving together.

This spectrum of electron energies falls on a metal plate which contains a slit. Only a narrow band of the electrons, having almost exactly similar energies, can pass through this narrow slit and strike the biological sample.

Source of the electrical "kick" behind the electron "bullets" is a Kenotron tube which supplies voltages from one to 15,000. The entire apparatus must be exhausted with vacuum pumps during operation.

Drs. Franklin S. Cooper, Charles E. Buchwald, Caryl P. Haskins and Robley Evans of M. I. T. and Union College describe the new instrument. They report (*Review of Scientific Instruments*, March) that plans are now under way for a larger device which will permit the use of voltages above 15,000.

Science News Letter, April 1, 1939

IN SCIENCE

AERONAUTICS

Research Lag Main Cause For Alarm In Aviation

THE LAG in aeronautical research behind Europe is the chief cause for alarm in the American aviation picture, G. Grant Mason, Jr., member of the Civil Aeronautics Authority, told the Society of Automotive Engineers.

Expanded European research facilities, combined with quantity production facilities, may produce a surplus of high performance commercial airplanes which will cut seriously the American export market, he indicated.

"With that situation confronting us," he told 200 aeronautical engineers, "the President has transmitted to Congress a request for an additional \$12,140,000 for the construction of new research facilities at Langley Field and for a new N. A. C. A. (National Advisory Committee for Aeronautics) laboratory at Sunnyvale, California. Congress is considering additional legislation designed to stimulate greatly increased experimentation and development by the industry. All of this will be of tremendous benefit to the future progress of aviation."

Science News Letter, April 1, 1939

PUBLIC HEALTH

Influenza Epidemic Less Except In Two Sections

INFLUENZA is declining in all parts of the country except Virginia and the Southwest, reports received by the U. S. Public Health Service show. Total for the nation for the week ending March 18 was 15,921. The previous week's total was 18,135.

This epidemic was not of special significance from the standpoint of the number of reported cases but public health officials point out that it was unusual because it started at the time of year when influenza epidemics in the past have been on the decline and the peak this year came during the second week of March, much later than usual. The first week of February is the latest previously recorded peak week for an influenza epidemic. This was in 1920.

Science News Letter, April 1, 1939

CE FIELDS

MEDICINE

To Train Dental Interns In Army Hospitals

THE U. S. ARMY is for the first time undertaking to train dental interns in its hospitals. Announcement of this new departure, seen as a development that will make the Army dental service more effective as a health service, was made by Brig. Gen. Leigh C. Fairbank, Chief of Dental Staff, U. S. Army, at a meeting of New York's Second District Dental Society. Brig. Gen. Fairbank is the first dentist to reach this rank in the Army.

Outstanding graduates of dental schools this year will be chosen for the new Army hospital internships.

Science News Letter, April 1, 1939

EDUCATION

Nursery Schools Could Be New Billion Dollar Industry

AMERICA can have a new billion dollar a year industry if it wants it. Children cry for it—those who have had a taste of it.

No, not candy, but nursery schools. Conventional schooling starts at six, or five where there are kindergartens. But intensive educational experiment and pioneering practice since the World War shows that the whole future lives of little boys and girls are greatly benefited by a special kind of schooling for those from two to six. Nursery schools under the guidance of trained teachers, supplementing the benefits of the home, bring the children into a happy, effective world ideally fitted for them. They like it, it is good for them, their parents appreciate the advantages and the child grows faster in intelligence as the result.

Public education has had its greatest development in America. Fathers and mothers have wanted their children to have more advantages than they themselves had when they were young.

With a gradually decelerating population growth, there will be fewer children in future years. There will be less pressure on the school systems of our nation. Interestingly, this comes just as the

worth of so-called pre-school education is being demonstrated.

There are about 600 to 700 private and public nursery schools in addition to the 2000 WPA nursery schools created in the past three years and available only to children of those in the very low income brackets. This means that little more than 100,000 children are in nursery schools whereas there are about a hundred times that many, some 10,000,000 children of nursery school age.

Here is material for a great educational expansion, an extension of the educational system into the younger years of childhood in order to have better men and women of the next generation. This expansion may well become economically possible with the continued decline of the birth rate.

Where WPA nursery schools have operated there is a growing demand from mothers and fathers who want to do better by their children. It is a folk movement with the same virility shown by the earlier American passion for free schools.

Science News Letter, April 1, 1939

PHYSICS

Cosmic Ray Particle Creates 50,000 Offspring

A SINGLE cosmic ray of high energy can create 50,000 other particles in a tremendous "burst" of atomic energy. Prof. Enrico Fermi, Nobel Prize-winner in physics for 1938, told the joint meeting of the Washington Academy of Sciences and the Philosophical Society of Washington.

Prof. Fermi, formerly of the University of Rome and now at Columbia University in New York, said that a cosmic ray with a thousand million million (1,000,000,000,000,000) electron volts of energy could produce such bursts over an area of about three hundred square yards.

Discussing the "mesotron" particle—new atomic particle about 100 times as heavy as an electron—Prof. Fermi credited the young Japanese physicist Yukawa with predicting the existence of such particles several years before their discovery in cosmic radiation. Yukawa, however, suggested the particles to interpret the inner binding energies with the hearts of atoms. It is the mesotron particle that now appears to account for the enormous piercing power of many cosmic rays which can pass through a whole yard of dense lead or into the earth, where they have been detected in deep mines.

Science News Letter, April 1, 1939

ASTRONOMY

New "Asteroid" Turns Out To Be Ten-Year Comet

WHEN Prof. Y. Väisälä of the University of Turku in Finland recently reported the discovery of a new tiny asteroid, astronomers throughout the world were interested but not surprised, for the Finnish astronomer is a specialist in finding such stellar wanderers.

Surprised, however, were astronomers when they learned that the asteroid, provisionally called object 1939 CB, had been found to be a comet with a 10-year period as a result of new observations by Prof. Väisälä.

The new Väisälä comet is very faint, of the 15th magnitude, and can be seen only with powerful telescopes. It is located in the "sickle" of the constellation Leo just north of the bright star Regulus. It passes the north-south meridian line about 9:30 o'clock in the evening. On March 15, its position was right ascension 9 hours, 37 minutes and six seconds and its declination plus 23 degrees seven minutes.

Despite its faintness, a short tail about one degree in length has been observed by Prof. G. Van Biesbroeck, of Yerkes Observatory.

Observed by Dr. H. M. Jeffers of the Lick Observatory, University of California, is the Pons-Winnecke comet, now back in the region of the sun and visible to powerful telescopes on earth. This comet is near the constellation of Bootes, which contains the bright star Arcturus. The comet passes the meridian line about three o'clock in the morning. Position of the Pons-Winnecke comet on March 17 was right ascension 14 hours, 36 minutes and 11.7 seconds and declination plus 31 degrees, 20 minutes and four seconds. At that time it was very faint, about the 17th magnitude.

Science News Letter, April 1, 1939

ARCHAEOLOGY

Carved Footprints Found In Rocks on Missouri Farm

CARVED representations of human foot and hand imprints have been found in rocks older than the Coal Age on the farm of Thomas L. Donnell near Festus, Mo. Human-like imprints in Coal Age rocks have been attributed to extinct giant amphibians, but these particular markings, reported by Robert McCormick Adams of Webster Groves, Mo., indicate their origin as artifacts by marks of the pecking tools with which they were cut.

Science News Letter, April 1, 1939



LAYING PLANKING

It is placed across a framework of copper and bronze. Only 700 pounds of the 600,000 pounds of metal on the vessel will be iron or magnetic steel. Cables and anchor, for example, are of bronze. Bronze rivets cost more than a dime apiece, bronze bolts for planking cost about 62 cents each.

PHYSICS

Unique Sailing Ship Will Cruise Seas for Science

British Brigantine-Rigged Craft, the Research, Will Have Hull of Teak With Magnetic Iron Barred

IN A QUIET reach of the River Dart in Devon, England, the most unusual ship in the world is now rapidly taking shape.

It is the Royal Research Ship Research, half a million dollars' worth of sailing vessel which is to set out next year on a series of voyages which will both make maritime history and advance man's knowledge of the earth on which he lives.

The R. R. S. Research will conduct surveys of variations in the magnetic field surrounding the earth, and thereby aid every man, whether aboard ship or airplane, who has to steer by magnetic compass.

Because study of magnetic variations is its prime purpose, as little magnetic steel and iron as possible have been built into it. Thus, naval architecture has taken a seeming step backward, returning from an era of steam and Diesel

power to sail, to enable a scientific stride forward.

There is nothing like the Research today, for the trim Brigantine-rigged craft replaces its only predecessor, the American ship "Carnegie," which blew up and burned off Samoa 10 years ago. Since research is the new vessel's purpose, its construction has been marked by international participation and the results of her voyages will be available to all. The services of W. J. Peters, former commander of the "Carnegie," which was operated by the Carnegie Institution of Washington, for example, have been loaned to the British Admiralty, which is building the Research.

By using often expensive and ingeniously contrived substitutes, the naval architects who have designed the Research have been able to dispense with all but 700 pounds of magnetic metal on the vessel. And this small amount, a tiny frac-

tion of the 600,000 pounds of metal on the ship, is confined principally to the auxiliary engines and dynamo.

Crew members, who, with four scientists aboard will number 31, will not even be permitted to carry steel pocket knives. The cables, anchor and all bolts are of bronze. Cooking utensils will be of aluminum. Food will be packed in bottles or cartons; no packing cases will be allowed, in order to make sure there are no stray packing case nails affecting the accuracy of the studies.

Bronze Rivets

Special squads of men have, in fact, been detailed to watch carefully over the boat's construction to make sure no iron sweepings are left. Rust is carefully scraped out of holes drilled to receive bronze rivets costing a dime apiece before the rivets are driven home.

The hull is of teak, famous heavy wood of the tropical Far East. Ancient arts, such as caulking with oakum, to seal the spaces between planks, have been revived in the construction of the Research.

Fuel oil for the Diesel motor which will give the Research a 2,000 mile cruising range at a speed of six knots will be carried in bronze tanks. Other liquid supplies will be contained in teak. A special crankshaft of non-magnetic steel had to be designed for the Diesel engine.

The reason underlying the expensive forethought that has gone into the two-masted ship's construction is the fact that the earth's magnetic pole does not coincide with the North Pole, and that it is slowly shifting. Now located in western Canada inside the Arctic Circle, it was once much farther east. In order that navigation be accurate, detailed studies of how the compass reads at different points must be carried out. In order that they be accurate, no magnetic material can be permitted nearby as it would interfere with the readings.

A wealth of special scientific equipment is to be carried aboard the Research. Besides its magnetic variation studies, it will be equipped for investigating atmospheric electricity, meteorology and ocean soundings.

Nearly 10,000 cubic feet of teak have gone into the making of the hull in the yards of Philip & Son at Dartmouth. A special order had to be sent to Burma for some of the woods used. The two main-masts are to be of Columbian pine. Bronze is being used for the framework and propeller and aluminum bronze for the windlass and winches, standing rigging and other essential parts.

The rivets in particular proved an expensive problem. Each hole had to be drilled; if steel were used, 20 rivet holes could have been punched in the time taken to drill the hole for one rivet.

Though iron has been eliminated from bath fittings in every other respect—by installing enameled teak tubs, for example—the designers did find one steel part they have been unable to eliminate—razor blades. But crew members, as well as not being permitted to have steel knives, will not be allowed steel buttons on their clothing. The scientists and others who must keep records will have to use brass paper clips instead of the more familiar steel wire type. One or two chisels and a saw will have to be steel, but they will be stowed as far away from the instruments as possible.

The Research will indeed pick up where the Carnegie had to leave off, for its first voyage will be to the Indian Ocean, where the ill-fated American vessel was to have gone in 1930, the year following its unforeseen disastrous end. Already, the Research's captain, Commander D. H. Fryer, is getting ready for his novel duties by taking a long voyage on a sailing ship.

Science News Letter, April 1, 1939



YOU WON'T SEE THIS OFTEN

Skilled craftsmen revive an ancient art by pounding in strands of oakum, later to be sealed with tar, to make the R. R. S. Research hull watertight. The hull is of teak. The days of "wooden ships and iron men" are not coming back . . . the men can't be iron on this boat. Crew members won't be permitted steel buttons or knives.

ARCHAEOLOGY

Solve Math Problem Of Egyptian Workmen

TWO Egyptologists have set themselves an arithmetic problem: Knowing dimensions of a huge artificial lake at Thebes, and the brief time in which Egyptians dug it, how many workers were required?

Reporting their work in the *Bulletin de l'Institut d'Egypte*, R. Engelbach and J. W. Macaldin take a privilege that school boys would envy. They offer two answers.

Either Pharaoh Amenophis III put 242,652 men to work on this lake of his, or else he employed 777,262. Even the smaller number would populate a sizable city. The men were rushed to work on the lake project and 16 days later water was let in, and Queen Tiy and King Amenophis sailed regally on their newest possession.

That Egyptians could organize for so swift a job is impressive. Amenophis announced the news of the big lake on a commemorative scarab, which told practically everything a news reader would want to know except the amount of labor. That probably was not rated of

news interest in 1396 B. C. The lake was over a mile long and over half a mile wide.

The Egyptologists get two answers as to laborers required because they do not know how far away the excavated earth was carried. If workmen dumped earth close to the lake, for the time being, 140,716 carriers would have been enough. If earth was removed to mounds farther off, 675,366 carriers were needed. In addition, the Egyptologists figure 50,968 diggers and an equal number of assistant diggers were required. They figure the problem by assuming the excavation was divided into bays in which gangs of diggers and carriers worked together. Egyptians work that way today.

Why Pharaoh Amenophis, one of Egypt's most glamorous and luxury-loving rulers, wanted the lake dug is uncertain. It may have been for his wife's enjoyment. Or it may have been designed as the private harbor for palace boats.

Science News Letter, April 1, 1939

PSYCHOLOGY

Color Blindness May Be In Mind as Well as Eyes

THE extremely close ties between the workings of the human mind and the human body are given new emphasis by an experiment in which color-blindness was produced by suggestion in a hypnotic trance.

When you see red, it is because of certain physical signals to the retina of your eye. But the interpretation of these signals as red—in fact the perception of them at all—depends upon your mental "set."

At Eloise Hospital, in Michigan, Dr. Milton H. Erickson hypnotized six persons with normal color vision and by suggestion deprived them of the ability to see red, green, red-green, or any color at all. The results he reported to the *Journal of General Psychology*.

It was not a simple task. First, under hypnosis the subjects were made com-

pletely blind. When they awoke from their trance, they were still blind and suffered from all the distress that you would feel if you suddenly roused from sleep without the ability to see.

This put them in a frame of mind to accept the restoration of sight upon any conditions set by the hypnotist. The condition was that they might see objects but not all colors. The suggestion of blindness for one color was carefully made so that the subject would lose all awareness of that color and even the name of it would become to him mere nonsense.

A strange incident occurred to emphasize the actual complexity of the relatively "simple" vision of color. One man who had in this manner lost his vision for red happened, more or less accidentally, to attempt to count his fingers. He

was puzzled to come out with the total eleven although he knew perfectly well that he had only ten fingers and thumbs. Again and again he tried. Counting gave him eleven; knowledge gave him only ten. Counting by two's he got ten; counting by one's he got eleven. It was soon evident to the examiner, but not

to the subject that he had lost his knowledge of the number three—each time in counting he skipped it.

Restoration under hypnosis of the concept of three automatically restored his color vision for red. The number three to this man meant red.

Science News Letter, April 1, 1939

ARCHAEOLOGY

Fate of King Solomon's Gold May Be Revealed in Find

FATE of King Solomon's Temple treasures may be revealed to the modern world, as archaeologists gaze wonderingly at the golden sarcophagus and inner silver coffin of Pharaoh Sheshonk, found in the Nile Delta at Tanis.

Perhaps millions of dollars worth of gold and silver melted to form these massive cases include cups and bowls from Solomon's Temple and palace in Jerusalem.

Ascribing the royal tomb to Pharaoh Sheshonk dates it as belonging to the twenty-third dynasty, and after King Solomon's death. The family alliance which Solomon made with Egypt, when he married a Pharaoh's daughter, wrought no permanent friendship with Egypt. Pharaoh Sheshonk the First—called Shishak in the Bible—invaded Palestine and sacked Solomon's Temple and Palace in Jerusalem, carrying off rich hauls of gold and silver.

What happened to this historic property in Egypt has often been wondered. Pharaoh Osarkon the first, who succeeded Sheshonk, made conspicuously generous gifts of gold and silver bowls and cups to priests in Egyptian temples.

His lists of religious giving include references to weight, which might imply fortunes in silver and gold. It is not too fanciful to suppose that some of the Hebrew art objects and Temple furnishings were converted into spectacular coffins for conqueror Sheshonk or one of the three later kings of this name.

That a rare turn of fate preserved the tomb of Sheshonk undisturbed is shown by the fact that Prof. Pierre Montet of the University of Strasbourg encountered only empty tombs until he met a solid wall, and discovered this tomb hidden back of it.

Egypt in the twelfth and thirteenth centuries B. C. had drifted into serious economic depression, when looting royal tombs at Thebes became a customary way for desperate natives to make a living. Harassed Pharaohs rescued royal mummies from plundered tombs, and moved them from one place to another, but found no rest for the Pharaohs until they dug a pit back of a temple in Thebes cemetery. There an illustrious assembly of royal Egyptians was found by Maspero in 1881, and these mummies now repose in Cairo Museum.

Science News Letter, April 1, 1939

Bureau of Dairy Industry will report the technical details of their discovery at the coming meeting of the American Chemical Society in Baltimore, early in April.

The cream from cow's milk is skimmed off to make butter and the casein is removed to make cheese or casein molding compounds. Then the virtually worthless whey is freed from its lactose, or milk sugar content. By fermenting the lactose, lactic acid is obtained and out of the latter comes the transparent, springy and tough polymethylacrylate.

The new discovery will be significant for Italy where the casein of milk is now being used on a large scale to produce lanital—a synthetic wool substitute used in army uniforms, blankets and general clothing. The Italians are at present neutralizing the whey and feeding it to swine, but they can just as easily turn the lactose into lactic acid and wind up with polymethylacrylate that will turn their lanital clothing into poison gas-resistant clothing.

Production of polymethylacrylate from lactic acid is just as cheap, report the U. S. chemists, as is its preparation from ethylene and alcohol by the customary cyanhydrin process. Polymethylacrylate products are in demand for the preparation of lacquers, varnishes, inks, cements and impregnating compounds. The established market means a wider outlet for dairy products.

While polymethylacrylate alone cannot be turned into hard, transparent resins it can be combined with the related organic glass and by polymerization yield a transparent resin superior to its component parts.

Science News Letter, April 1, 1939

Poison ivy and ragweed are unknown in Yellowstone National Park.

CHEMISTRY

Whey Product Makes Cloth Resistant to Poison Gas

OUT of the whey of cow's milk—now virtually a waste product of the dairy industry—government scientists are producing a new chemical that has the power to prevent the penetration of poisonous gases through clothing.

The chemical, looking and feeling quite like a transparent art-gum type of

eraser, is polymethylacrylate. While related chemically to the transparent resins known as the organic "glasses" it cannot, of itself, be made into a hard material. Mainly its greatest use comes from the impregnation of fabrics so that they are resistant to oil, water and gases.

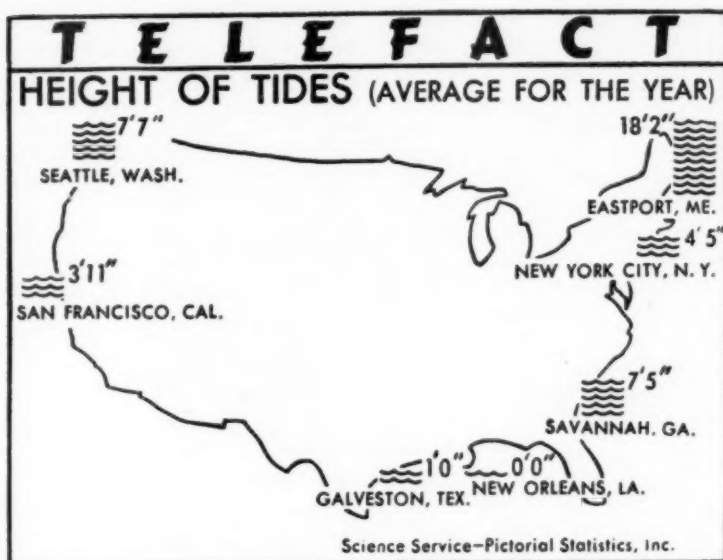
Dr. Lee T. Smith and H. V. Claborn of the research laboratories at the U. S.

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RADIO

Obsolescence is No Worry To Purchaser of Radio

Television and Static Free Broadcasting Are Both So Far in the Future That Consumers May Forget Them

DEMONSTRATIONS of successful television and improved static-free radio have brought inquiries from readers who are worrying about whether they should buy new radio sets, of present type, or whether they ought to wait for combination television-radio sets of superior type.

The answer, agree manufacturers, is that television and the new system of broadcasting that eliminates static interference are both so far in the future that there is no need for delay.

Both television and the new broadcasting system, invented by Major Edwin H. Armstrong, work on ultra-high frequency waves. This means that their range of reception is not much over the line-of-sight distance from a tall skyscraper like those in New York; say over a distance of about 50 miles. On some rare occasions there may be freak reception over longer distances—as in the recent case of British television programs being received on Long Island—but for real service 50 miles is nearly the maximum.

Along with this limited reception is the difficulty of using high frequency television, or static-free radio on a nationwide network. It requires very cost-

ly special coaxial cable to handle the high frequencies over wires and a nationwide link of such cable is distinctly in the future. It probably will come eventually but the development is years away.

All of which means that the programs of television and the new radio system will be distinctly local affairs and in terms of entertainment this means that the extravagant, costly radio shows with high-priced talent probably will be the exception. The high cost of the better radio programs is justifiable only when a vast nationwide audience can be reached.

To answer the question one can say "Your 1939 radio will have years of service lasting as long as the set remains in operation."

Science News Letter, April 1, 1939

ORNITHOLOGY

Nest Protection Aids Eider Ducks' Return

EIDER-down quilts and pillows used to be made from the down of eider ducks. They aren't any more, because merciless hunting by the commercial down gatherers has made eider ducks

very scarce. There is considerable danger that the species may be exterminated.

In the face of this un-cheerful situation, a report from the little Baltic republic of Esthonia is encouraging. On the tiny island of Filsand and its neighboring reefs is a great rookery of several kinds of sea birds, including about 700 eider ducks.

Less than thirty years ago there was only one pair of the ducks. Then a measure of protection was given them, which has been greatly increased since the wartime birth of the republic through the zeal of two ornithologists, Arthur Toom and F. E. Stoll. Protection given during Czarist days helped the eider duck colony to grow to a population of 50. The efficacy of the protection given under the new republican regime is shown by more recent figures: 600 in 1933, and 700 at the close of 1938.

The adult ducks need little assistance, but their young and eggs have many enemies, particularly several species of gulls that permanently inhabit the island and the reefs, and during migrating times the great northern raven. The gulls are kept from increasing to overwhelming numbers by raiding their nests and destroying the eggs. The eider ducks themselves have learned to frustrate their raven foes by sitting tight on the nests while the latter are about.

The human population of the island has a history of increase almost as remarkable as that of the ducks. At the beginning of the eighteenth century a Dutch ship was wrecked on the hitherto uninhabited island. The captain and the survivors of the crew settled there, took wives and reared families, until now there are 170 persons living on Filsand, all descended from this original group. They have all become interested in the preservation of the eider ducks and willingly assist the efforts of the ornithologists.

Science News Letter, April 1, 1939

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Spring Flowers Are Short

SPRING flowers are typically low-growing, short-stemmed. The ones you think of first—violets, buttercups, hepaticas, bloodroots, wood anemones, spring beauties—all lift their pretty heads only a few inches above the ground. Even those that rate as tall—Solomon's seal, Dutchman's breeches, columbine, wild geranium, Jack-in-the-pulpit—do well if they can develop stems one and one-half or two feet long.

Out in the open, which we are used to thinking of as typically the home of tall flowers, the early spring flowers are short, as exemplified by Pasque flower, Pussy's-toes, star-grass and bluets.

Contrast this with the tall and towering stems of the summer and early autumn plants, that range from waist-high to half again the height of a tall man—things like the goldenrods and wild asters, wild sunflowers, rosinweeds, eupatoriums, ironweed and blue vervain.

It is interesting to speculate on possible reasons for this shift from delicate humility to towering pride.

One fairly obvious factor, of course, is lack of time for spring flowers to become tall. They blossom from a week to a couple of months after the last snow

has melted, and if they are to do that they can't spend much time on growing long stems. Quickies must be shorties.

In the woods at least, spring flowers must necessarily be quickies. In the earliest weeks of spring, even in the South, trees are still bare, or at least have such small leaves that a considerable amount of sunlight filters through. After the leafy canopy has closed conditions are not so favorable for flowering, down on the forest floor. A census of the flowers of woodlands will show a considerable majority of early blossomers.

Low stature for spring flowers of the grasslands would seem to be at least partly conditioned by evaporation and the buffeting of the wind. Pasque flowers, with their hairy covering on leaf, stem and petal alike, and their habit of nestling tight down among the dry grasses of yesteryear, are well adapted for the windy world into which they are born. If a six-foot sunflower or cup-weed could try conclusions with the gusts of late March and early April it might not survive so well.

Science News Letter, April 1, 1939

BIOLOGY

Special Microscope Mount Shows Growth of Cells

LIVING cells in the tips of grass roots can be watched as they grow and divide, in a simple new arrangement for placing them under the lens of a microscope, devised in the botanical laboratory of Prof. Edmund W. Sinnott of Columbia University.

The method consists in using two slips of moist transparent paper, between which very small grass seeds are placed and allowed to germinate. They produce roots so slender and transparent that the microscope discloses all details of their growth, hitherto discernible only by indirect, slow and more expensive methods, and on dead tissues.

Among the points already found out

about cells of grass roots:

1. New cell walls stay where they are formed, never migrating to new positions.

2. Such new walls are not always flat. They are sometimes curved, following the physical laws that govern the formation of bubbles.

3. Cells usually divide into equal halves, but sometimes the new cells are unequal in size. Then the smaller one, nearest the tip of the root, produces an extension known as root hair.

4. Cells stay in the same relative positions; they do not slip or slide past each other.

Science News Letter, April 1, 1939

AGRICULTURE

New Sweet Corn Variety Resistant To Ear Worms

GOOD news for lovers of corn-on-the-cob, in the Southern states, anyway. A new variety of sweet corn developed by U. S. Department of Agriculture plant breeders at the Puerto Rico Experiment Station is resistant to corn earworm.

Coming as it does from the crossing of tropical corn varieties, the new sweet corn is not suitable for planting in the North, where it "runs to stalk" and does not mature early enough. In the South, however, it grows very satisfactorily. Further breeding now in progress aims to produce a variety suitable for growing in the north.

Science News Letter, April 1, 1939

AGRICULTURE

Soil Moisture Measured By Electric Current

MOISTURE in the soil, an important factor in crop production, can be measured quickly and easily by a new method, invented by George J. Bouyoucos and A. H. Mick of the Michigan Agricultural Experiment Station. (*Science*, March 17)

It depends on the fact that moisture in a buried block of gypsum varies along with the moisture in the soil, while the electrical conductivity of the block in turn varies with its moisture. Accordingly, all they need to do is bury a gypsum block of standard dimensions, with a pair of wires attached to it, leading to a source of current and a current-measuring instrument.

The new method is said to be particularly accurate in its indication of the low moisture-point at which plants begin to wilt.

Science News Letter, April 1, 1939

SCIENCE NEWS

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Additional Reviews
On Page 208

History

THE TRUE HISTORY OF THE CONQUEST OF MEXICO—Bernal Diaz Del Castillo; translated from the original Spanish by Maurice Keatinge—*McBride*, 562 p., \$3.75. Written in the year 1568 by one of the survivors of Cortez' band of Conquistadores, this book gives a vivid picture of Mexico as it was before the white man came, and the incredible adventures of the band of Spaniards who conquered it. A new printing.

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Biography

MEIN KAMPF—Adolf Hitler—*Stackpole*, 669 p., \$3. An unauthorized edition paying no royalty to Hitler. The publishers claim that this is justified because Hitler was not a citizen of either Germany or Austria when he registered his book in Washington, D. C. The names of the translators are not given, but the translation was made from the two-volume first edition. Changes made by Hitler in later editions were adopted in the translation only when they were made to clear up meaning and correct language.

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Medicine

FUNDAMENTALS OF PHYSICAL EXAMINATION—George G. Deaver—*Saunders*, 299 p., \$2.75. For physical educators and public health and school nurses.

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Medicine

REFRACTION OF THE HUMAN EYE AND METHODS OF ESTIMATING THE REFRACTION (3d ed.)—James Thorington—*Blakiston's*, 412 p., \$3.50.

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Mathematics

CHILD-LIFE NUMBER BOOK—Charles E. Garner and Livingstone McCartney—*Lyons and Carnahan*, 239 p., illus., 54 c. Arithmetic for little tots of pre-school age which will coordinate their sizable but scattered knowledge of numbers.

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Economics

FOODS—Production, Marketing, Consumption—Jean J. Stewart—*Prentice-Hall*, 737 p., \$3.25. Here is a book all about the foods we eat which seeks to do three things: 1. To lead individuals to think of food problems and discover their proper solutions. 2. To lead individuals to think in terms of life situations and to keep an open-mindedness

in considering new points of view. 3. To provide those places where information on food topics may be obtained. The history and economics of food production are given.

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Child Study

THE ACTIVITY OF YOUNG CHILDREN DURING SLEEP—Chester Roy Garvey—*Univ. of Minn.*, 102 p., \$2. Here are the answers to some of the questions puzzling parents regarding the effect on children's sleep of time of going to bed, late active play, ventilation, temperature, afternoon naps, position of sleep and many other factors. Children take twice as long to go to sleep as do adults and they move about twice as often.

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Physics—Astronomy

AN INTRODUCTION TO THE STUDY OF STELLAR STRUCTURE—S. Chandrasekhar—*Univ. of Chicago*, 509 p., \$10. The assistant professor of theoretical astrophysics at Yerkes Observatory of the University of Chicago presents a theory of stellar structure from a consistent point of view and, as far as possible, in totally rigorous fashion. This book is intended completely for the expert.

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Chemistry

MOTOR FUELS FROM FARM PRODUCTS—P. Burke Jacobs and Harry P. Newton—*Govt. Print. Off.*, 129 p., 15 c. The facts on power alcohol as told by experts in the U. S. Department of Agriculture.

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General Science

RESEARCH—A NATIONAL RESOURCE: I. RELATION OF THE FEDERAL GOVERNMENT TO RESEARCH—Report of the Science Committee to the National Resources Committee—*Govt. Print. Off.*, 255 p., 50 c. See *SCIENCE NEWS LETTER*, Feb. 4, 1939, p. 77.

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Child Study

BIOGRAPHIES OF CHILD DEVELOPMENT—Arnold Gesell, Burton M. Castner, Helen Thompson and Catherine S. Amatruda—*Hoeber*, 328 p., \$3.75. The mental growth careers of 84 infants and children studied during the course of ten years of research at the Yale Clinic of Child Development. The authors stress the importance of inherited or constitutional factors which make each child's rate and pattern of development an individual matter.

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Anthropology—Psychology

THE AMERICAN CRIMINAL, AN ANTHROPOLOGICAL STUDY. Vol. I, The Native White Criminal of Native Parentage—Earnest Albert Hooton—*Harvard Univ. Press*, Text, 309 p. appendix about 400 p., index, \$10. The first volume of a comprehensive report of research carried out by the Division of Anthropology of Harvard University with the co-operation of the Massachusetts State Department of Mental Diseases. The well-known anthropologist here presents evidence that physique is related to personality in these subjects. Since other scientific studies in this field have failed to reveal the sort of linking of personality and physical traits reported here by Prof. Hooton, it is anticipated that this book will evoke considerable discussion among psychologists.

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Criminology

CRIME AND THE MAN—Earnest Albert Hooton—*Harvard Univ. Press*, 403 p., \$3.75. A popularized and condensed report for laymen of Professor Hooton's study of the relation of physique to personality traits among criminals.

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Chemistry

PHYSICO CHEMICAL EXPERIMENTS—Robert Livingston—*Macmillan*, 257 p., \$2.25. A laboratory course in physical chemistry with emphasis on the illustration of the basic principles of the subject. Every effort has been made to avoid the usual "cook book" sort of directions.

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Psychology

THE PLACE OF VALUE IN A WORLD OF FACT — Wolfgang Köhler — *Liveright*, 418 p., \$3.75. Do scientists, with their immense interest in fact, lack an understanding of the importance of their findings in human affairs? This question, raised by the author, is the theme of these William James lectures delivered by the author of "Gestalt Psychology" at Harvard University in 1934.

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Medicine—Zoology

CHRONIC ARTHRITIS IN WILD MAMMALS—Herbert Fox—*American Philosophical Soc.*; distributed by *Univ. of Penna. Press*, 149 p., 12 plates, \$2. Monographic treatment of arthritic lesions in more than 1700 specimens of wild mammals representing all principal orders. (See also SNL, April 30, 1938).

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Chemistry

SYNTHETIC ORGANIC CHEMICALS: WORLD DEVELOPMENTS AND FOREIGN MARKETS—C. C. Concannon and J. N. Taylor—*Govt. Print. Off.*, 164 p., 20 c. If this little book had been written 25 years ago it would have shown that Germany was the country towering over all others in the volume of organic chemical production. The past quarter century has shown a completely changed picture following the World War. This government publication compiles the statistics and information on the entire world as of September 1938.

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Chemistry

MODERN ATOMIC THEORY: AN ELEMENTARY INTRODUCTION—J. C. Speakman—*Longmans, Green*, 207 p., \$2. A British chemist reviews the present status of atomic theory, aiming especially at students in universities and possibly the general scientific reader also.

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Biology

HITCH-HIKING WITH JIMMY MICROBE—Virginia and Drew Jacobsen, and Lyman L. Daines—*Reilly and Lee*, 92 p., colored illustrations, \$1. The authors attempt to make bacteriology palatable to children by the old and worn-out device of anthropomorphizing microbes.

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Chemistry

ORGANIC CHEMISTRY—Paul Karrer; trans. from latest German ed. by A. J. Mee—*Nordemann*, 902 p., \$11. Here is

the much-anticipated translation of a famous German textbook which has entered its fifth edition in ten short years. With over 900 pages, the book is classed as "medium sized" by the author which illustrates the thoroughness of treatment employed. Special emphasis is laid on methods of synthesis and many problems of stereochemistry are fully dealt with. Because of the discussion of biochemistry the book has value not only for chemists, but also for students of medicine.

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Mechanics

CONTRIBUTIONS TO THE MECHANICS OF SOLIDS DEDICATED TO STEPHEN TIMOSHENKO BY HIS FRIENDS ON THE OCCASION OF HIS SIXTIETH BIRTHDAY ANNIVERSARY—*Macmillan*, 277 p., illus., \$5. A collection of technical papers on mechanics which make a highly fitting tribute to a brilliant engineer.

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Conservation

WATER — WEALTH OR WASTE—William Clayton Pryor and Helen Sloman Pryor—*Harcourt, Brace*, 242 p., illus., \$2.50. Water is looked at from every imaginable angle—as something to drink, wash with, sail on, fish in, employ in irrigation and power works, fight in floods and erosion. Unique in conception, this book will surely please a wide audience. The authors, known for a series of photographic books, have illustrated this one plentifully.

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General Science

SO THAT'S THE REASON! — R. Ray Baker—*Reilly and Lee*, 125 p., illus., \$1. A book in big print for small readers, that knows how to make hard facts easy to understand, yet without falling into the trap of inaccuracy that lurks in attempts at over-simplification.

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Ecology

DESERTS—Gayle Pickwell—*Whittlesey*, 174 p., 64 pl., \$3.50. Companion volume to the author's *Weather* (SNL Nov. 20, 1937) this book has the same high value both for the facts which its text entertainingly imparts and for the really superb photographs that supply the full-page illustrations. If you are interested in the natural history of deserts you will find this book fascinating; if you read this book without previous knowledge of deserts you will thenceforth find them fascinating.

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Biography

MEN OF POWER. Vol. III. Benjamin Franklin, Ralph Waldo Emerson, George Fox, Charles Darwin—Fred Eastman—*Cokesbury Press*, 200 p., \$1.50. Biographical sketches of four men who influenced the courses of thought and action of people long after their time, compactly and simply presented. Suitable for school use.

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Political Science

DEMOCRACY AND SOCIALISM—Arthur Rosenberg—*Knopf*, 375 p., \$3.50. A critical and searching historical essay by the former professor of history at the University of Berlin, now an emigré in this country. Prof. Rosenberg brings to his work the advantages of a close-up knowledge of Central European conditions antecedent to the World War and the present débacle.

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Zoology

THE DOBERMANN PINSCHER; History and Development of the Breed—Philipp Gruenig; trans. by Maximilian von Hoegen—*Orange Judd*, 311 p., illus., \$3.50. A detailed account of the breeding, anatomy, and judging points of an increasingly popular breed of dogs, together with individual histories of outstanding animals.

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Seismology

EARTHQUAKE HISTORY OF THE UNITED STATES. Part I, Continental United States (Exclusive of California and Western Nevada) and Alaska—N. H. Heck, 85 p., 20 c. Part II, California and Western Nevada—H. O. Wood, M. W. Allen and N. H. Heck, 25 p., 10 c.—*Govt. Print. Off.* See page 195.

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Psychology

THE INNER WORLD OF MAN—Frances G. Wickes—*Farrar & Rinehart*, 313 p., 79 plates, \$3.50. The author is a follower of Jung.

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Sociology

THE FAMILY, A DYNAMIC INTERPRETATION—Willard Waller—*Cordon Co.*, 621 p., \$3.25. A study of family life of middle class persons in the United States intended for use as a text in college courses. The author is associate professor of sociology at Barnard College. Chapters on conflict, bereavement, and divorce are included.

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